

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 7

### REMARKS

Claims 1 and 27 have been amended to more clearly define Applicant's invention. In particular, both of these claims have been amended to recite that the ink composition is an inkjet ink composition and that the polyvalent cation is a polyvalent metal cation. A grammatical error has also been corrected. Claims 4, 14, and 30, have been cancelled in view of this amendment, and claims 15-17, which had depended from claim 14, have been amended to depend from claim 1. In addition, claims 10, 26, and 31-32, 34-48, and 50 have been cancelled without prejudice to filing these claims in one or more continuation applications. Finally, claims 33 and 49 have been amended to be in independent form, including all of the features of the base claim and any intervening claims. No new matter has been added. Thus, claims 1-3, 5-9, 11-13, 15-19, 22-25, 27-29, 33, and 49 are pending.

### Claim Objections

The Examiner has objected to claim 14 as being of improper dependent form for failing to further limit the subject matter of a previous claim.

In paragraph 3 of the Office Action, the Examiner states that this claim discloses that the polyvalent ion of the salt comprises a polyvalent metal cation while claim 1 discloses that the salt comprises a polyvalent cation. The Examiner concludes that claim 14 fails to limit the scope of the claim on which it depends (claim 1) given that claim 14 recites the limitation already disclosed in claim 1.

Applicant respectfully disagrees. Not all polyvalent cations are polyvalent metal cations. However, in order to advance prosecution of the present application, Applicants have amended claim 1 to recite "polyvalent metal cation" and have cancelled claim 14 in view of this amendment, making the objection moot.

U.S. Patent Application No.: 10/062,112  
Art Unit: 1714  
Page 8

**Rejection of Claims under 35 U.S.C. § 103(a)**

**Betto et. al. in view of WO 96/18695**

The Examiner has rejected claim 1-2, 4-17, 22-28, and 30 as being unpatentable over Betto et al. (U.S. Patent No. 6,406,606) in view of WO 96/18695.

In paragraph 5 of the Office Action, the Examiner states that Betto et al. discloses an ink comprising water, 1-13% polymer containing carboxylic acid groups or sulfonic acid groups, 3-18% electrolyte that includes alkaline earth metal halide such as calcium chloride, and 6.5-15% colorant that is a self-dispersing colored pigment. The Examiner further states that a method of generating an image comprising incorporating the ink into a printer and generating an image on a substrate is also disclosed.

The Examiner acknowledges that there is no disclosure that the ink of Betto et al. is an inkjet ink and that there is no disclosure that the functional group present on the polymer is capable of coordinating with the polyvalent metal ion of the electrolyte. However, the Examiner states that, given that Betto et al. discloses an ink as presently claimed, it is clear that the ink would intrinsically be capable of functioning as an inkjet ink. The Examiner further states that, given that Betto et al. discloses a salt comprising a polyvalent metal cation and a polymer comprising an anionic functional group identical to those present claimed, it is also clear that the functional group of the polymer is intrinsically capable of coordinating with the polyvalent ion.

The Examiner notes that the difference between Betto et al. and the present invention is that, while this reference discloses the use of a self-dispersing pigment, there is no explicit disclosure of the functional groups attached to the pigment. For this reason, the Examiner relies on WO 96/18695, which the Examiner states is drawn to an inkjet ink and discloses a modified pigment comprising a pigment having attached a functional group including carboxyl

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 9

groups. The Examiner also states that, while there is no disclosure that the functional group is capable of coordinating with the polyvalent ion of the electrolyte disclosed by Betto et al., given that WO 96/18695 discloses pigments having attached anionic functional groups identical to that present claimed and that Betto et al. discloses a salt comprising a polyvalent cation identical to that presently claimed, it is clear that the functional group of the pigment is intrinsically capable of coordinating with the polyvalent ion. The Examiner therefore concludes that, in light of the motivation for using the specific self-dispersing pigment disclosed by WO 96/18695, which have increased dispersibility compared to untreated pigments, it would have been obvious to one of ordinary skill in the art to use such a pigment in the ink of Betto et al. and thereby arrive at the claimed invention.

Applicant respectfully disagrees. Regarding claims 1-2, 4-17, and 22-26, claim 1, as amended, recites an ink composition comprising a) a liquid vehicle, b) at least one modified pigment comprising a pigment having attached at least one functional group, c) at least one salt having a polyvalent ion, and d) at least one polymer comprising at least one functional group. The functional group of the modified pigment and of the polymer are capable of coordinating with said polyvalent ion and are anionic. The salt comprises a polyvalent metal cation, and the ink composition is an inkjet ink composition.

By comparison, and as acknowledged by the Examiner, Betto et al. does not disclose, teach, or suggest an inkjet ink, as presently claimed. Rather, Betto et al. relates to an electrocoagulation printing ink and method in which an electrocoagulation ink is deposited on an electrode surface and multivalent metal ions elute from the electrode surface causing the electrolytically coagulatable polymer contained in the electrocoagulation ink to coagulate (see column 1, lines 20-40). This is a very different type of printing compared to inkjet ink printing, which, as described in the present application, is a non-impact process wherein droplets of ink are ejected from a nozzle onto a substrate in response to an electronic signal (see paragraph [0049] of the present application). The requirements of these two printing methods are very different, and an ink that can be used for one type of printing may not be useable in another type of printing. Since there is no disclosure, teaching, or suggestion that

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 10

inks usable in the electrocoagulation printing method of Betto et al. may be used for inkjet ink printing, Applicant believes that one skilled in the art would not look to electrocoagulation printing methods to prepare inks for inkjet ink printing.

In addition, Betto et al. clearly teaches away from the disclosed ink being capable of functioning as an inkjet ink. For example, as noted above, Betto et al. states that, when a polyvalent metal ion elutes from the electrode surface, the polymer coagulates. Furthermore, while the multivalent metal ions are essential for forming a coagulated ink on the electrode, "the multivalent metal ions may chemically bond with the electrolytically coagulatable polymer in the ink before the electrocoagulation of the ink, thereby increasing the viscosity of the ink" (see column 14, lines 20-27). The ink may then turn to a "gel state" (see column 14, lines 27-33). One skilled in the art would not expect such a gelled ink to be ejected from a nozzle of an inkjet printer. Rather, based on the teaching of Betto et al., one skilled in the art would expect that an ink comprising a material having a functional group capable of coordinating with a metal ion would coagulate upon addition of a salt having a polyvalent metal ion and would therefore not be useable as an inkjet ink. This is further supported by the observations noted in the present application (see paragraph [0046] as well as the Examples).

Thus, Applicant believes that, not only does Betto et al. not disclose, teach, or suggest an inkjet ink, in fact this reference teaches away from the use of the electrocoagulation ink as an inkjet ink.

Therefore, Applicant believes that one skilled in the art would not be motivated to use the ink of Betto et al. in any ink composition useful for inkjet ink printing and, in particular, in the ink composition of WO 96/18695, which relates to inkjet inks. One skilled in the art would not combine this reference with Betto et al. since they each describe very different and unrelated printing methods. Furthermore, as described above, Betto et al. teaches that the electrolytically coagulatable ink coagulates in the presence of multivalent metal ions, and therefore one skilled in the art would not be motivated to use the specific pigments of WO 96/18695, used for inkjet ink printing, in the ink of Betto et al., which would not be used as an inkjet ink. Thus, WO 96/18695 cannot cure the deficiencies of Betto et al.

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 11

Applicant therefore believes that claim 1 is patentable over Betto et al. in view of WO 96/18695. Claims 2, 5-9, 11-13, 15-17, and 22-25, which depend either directly or indirectly from claim 1, recite further embodiments of the present invention and, for at least the reasons discussed above, are also patentable over these references. Claims 4, 10, 14, and 26 have been cancelled by this amendment, making the rejection of these claims moot.

Regarding claims 27, 28, and 30, claim 27, as amended, recites a method of generating an image comprising incorporating into a printing apparatus an ink composition of the present invention and generating an image on a substrate. The method is an inkjet ink printing method. Since, as discussed in more detail above, Applicant believes the ink composition of the present invention is patentable over this Betto et al. in view of WO 96/18695, Applicant further believes that an inkjet printing method using this inkjet ink is also patentable over this combination of references. There is no disclosure, teaching, or suggestion of an inkjet printing method in Betto et al. and, in fact, this reference teaches away from such a method. As discussed above, WO 96/18695, which relates to inkjet inks and printing, cannot cure the deficiencies of Betto et al. since it is unrelated art and would not be combined with Betto et al. by one skilled in the art.

Applicant therefore believes that claim 27 is patentable over Betto et al. in view of WO 96/18695. Claim 28, which depends directly from claim 27, recites further embodiments of the present invention and, for at least the reasons discussed above, is also patentable over these references. Claim 30 has been cancelled by this amendment, making the rejection of this claim moot.

Therefore, Applicant believes that claim 1-2, 4-17, 22-28, and 30 are patentable over Betto et al. in view of WO 96/18695 and respectfully requests that this rejection be withdrawn.

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 12

Takahashi et al. in view of Ichizawa et al. or Branham

The Examiner has rejected claims 31-32, 34-39, 41-45, 47-48, and 50 as being unpatentable over Takahashi et al. (U.S. Patent Publication No. 2004/0082686) in view of either Ichizawa et al. (U.S. Patent No. 6,368,397) or Branham (U.S. Patent No. 5,814,683).

In paragraph 6 of the Office Action, the Examiner states Takahashi et al. discloses an aqueous inkjet ink comprising water, a cationic polymer comprising a cationic functional group, a cationic pigment that is a modified pigment having attached at least one cationic functional group such as an amino group. The Examiner further states that an inkjet method is also disclosed.

The Examiner notes that the difference between Takahashi et al. and the present claimed invention is the requirement in the claims of a salt containing a polyvalent anion. The Examiner therefore relies on either Ichizawa et al. or Branham. Regarding Ichizawa, the Examiner states that this reference discloses the use of a salt including those with polyvalent anions such as phosphate in order to control the pH of the ink in order to prevent corrosion and dissolution of the print head. Regarding Branham, the Examiner states that this reference discloses the use of a salt including those with polyvalent anions such as tartrate and sulfate in order to prevent color bleed. The Examiner further states that, although there is no disclosure that the functional group present on either the pigment or the polymer as disclosed by Takahashi et al. is capable of coordinating with the polyvalent ion of the salt disclosed by Ichizawa et al. or Branham, given that Takahashi et al. discloses a pigment having attached cationic functional groups and a polymer comprising a cationic functional group, identical to that presently claimed, and given that either Ichizawa et al. or Branham discloses a salt comprising a polyvalent anion identical to that presently claimed, it is clear that the functional group of the pigment or polymer is intrinsically capable of coordinating with the polyvalent ion. The Examiner therefore concludes that, in light of the motivation to use a salt comprising a polyvalent anion disclosed by either Ichizawa et al. or Branham, it would have been obvious to one of ordinary skill in the art to use such a salt in the ink of Takahashi et al. in order to

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 13

either produce an ink that will not corrode the print head or to produce an ink with reduced color bleed, thereby arriving at the claimed invention.

While Applicant disagrees with this rejection and the conclusions reached by the Examiner, in order to advance prosecution of this application, claims 31-32, 34-39, 41-45, 47-48, and 50 have been cancelled without prejudice to filing these claims in one or more continuation applications. Therefore, the rejection of these claims is moot.

Takahashi et al. in view of Ichizawa et al. or Branham and further in view of Tsang et al.

The Examiner has rejected claims 40 and 46 as being unpatentable over Takahashi et al. (U.S. Patent Publication No. 2004/0082686) in view of either Ichizawa et al. (U.S. Patent No. 6,368,397) or Branham (U.S. Patent No. 5,814,683), as applied to claims 31-32, 34-39, 41-45, 47-48, and 50 above, and further in view of Tsang et al. (U.S. Patent No. 6,150,433).

In paragraph 7 of the Office Action, the Examiner states that the difference between Takahashi et al. in view of either Ichizawa et al. or Branham and the presently claimed invention is the requirement in the claims of a pigment having an attached polymer. The Examiner further states that Tsang et al. discloses the use of a pigment having an attached polymer wherein the polymer includes cationic polymers containing quaternary ammonium groups in order to produce an ink with reduced smear and increased water fastness, bleed control, and print quality. The Examiner therefore concludes that, in light of the motivation for using a pigment with an attached cationic polymer disclosed by Tsang et al., it would have been obvious to one of ordinary skill in the art to use such a pigment in the ink of Takahashi et al. in order to produce an ink with reduced smear and increased water fastness, bleed control, and print quality, thereby arriving at the claimed invention.

While Applicant disagrees with this rejection and the conclusions reached by the Examiner, in order to advance prosecution of this application, claims 40 and 46 have been cancelled without prejudice to filing these claims in one or more continuation applications.

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 14

Therefore, the rejection of these claims is moot.

Zhu in view of WO 96/18695

The Examiner has rejected claims 1-2, 4-9, 11-17, 22-25, 27-28, and 30 as being unpatentable over Zhu (U.S. Patent No. 5,889,083) in view of WO 96/18596.

In paragraph 8 of the Office Action, the Examiner states that Zhu discloses ink jet inks comprising an aqueous liquid vehicle, a modified pigment such as carbon black and cyan, magenta, and yellow, and a polymer such as styrene-acrylate copolymer, acrylic copolymer, and acrylic acid-(meth)acrylate copolymer, and a salt having a polyvalent metal cation such as calcium. The Examiner also states that, although there is no disclosure that the functional group of the polymer is capable of coordinating with the polyvalent ion, given that Zhu discloses a salt comprising a polyvalent cation identical to that presently claimed and a polymer comprising functional groups identical to that presently claimed, it is clear that the functional group of the polymer is intrinsically capable of coordinating with the polyvalent ion.

The Examiner notes that the difference between Zhu and the present invention is the requirement in the claims of a modified pigment. For this reason, the Examiner relies on WO 96/18695, which the Examiner states discloses modified pigments comprising a pigment such as carbon black having attached functional groups including carboxyl groups that are easy to disperse without a need for the ink to contain a dispersant and which have increased dispersibility compared to untreated pigments. The Examiner further states that, although there is no disclosure that either the functional group present on the pigment as disclosed in WO 96/18695 is capable of coordinating with the polyvalent ion of the salt as disclosed by Zhu, given that WO 96/18695 discloses pigments having attached functional groups identical to that presently claimed and Zhu discloses salts comprising polyvalent ions identical to that presently claimed, it is clear that the functional group of the pigment is intrinsically capable of coordinating with the polyvalent ion. The Examiner therefore concludes that, in light of the motivation for using a modified pigment disclosed by WO 96/18695 as described above, it would have been obvious to one of ordinary skill in the art to use

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 15

such a pigment in the ink jet ink of Zhu in order to produce an ink which does not require a dispersant and thereby arrive at the claimed invention.

In paragraph 1 of the Office Action, the Examiner states that Applicant's previous arguments filed January 3, 2005 have been considered but they are not persuasive.

a) In response to Applicant's argument that there is no disclosure of a modified pigment in Zhu, the Examiner states that, while it is agreed that there is no disclosure in Zhu of modified pigment, this is why Zhu is used in combination with WO 96/18695. The Examiner states that WO 96/18695 discloses the use of modified pigment identical to that presently claimed and further discloses that it is advantageous to use modified pigment instead of conventional pigments given that modified pigment (having ionic functional group) are easier to disperse and do not require the use of dispersant.

The Examiner further states that, while there is no disclosure in WO 96/18695 of a polyvalent salt, it is noted that, this reference is used as a teaching reference in combination with Zhu, and therefore, it is not necessary for this secondary reference to contain all of the features of the presently claimed invention. The Examiner states that this reference teaches a certain concept, namely the use of modified pigments in inkjet inks.

b) In response to Applicant's argument that, while Zhu discloses that "any" pigment can be used, there is no teaching or suggestion that any of the potential pigments can or should have attached anionic functional groups, the Examiner states that, while it is agreed that there is no disclosure in Zhu that pigments having anionic functional groups are utilized, there is nothing in the reference that excludes the use of such pigments. The Examiner concludes that Zhu discloses the use of "any" pigment without restriction.

c) In response to Applicant's argument that one of ordinary skill in the art would not combine a salt having a polyvalent cation as disclosed by Zhu with a pigment having an anionic functional group as disclosed by WO 96/18695 since destabilization of the pigment would be

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 16

expected, the Examiner states that, given that Zhu also discloses the use of a polymer which is capable of coordinating with the salt having a polyvalent cation, it is not clear that one of ordinary skill in the art would have recognized that addition of a modified pigment would destabilize the ink of Zhu. As evidence, the Examiner sites JP 2001-081378 and Betto et al. The Examiner states that both of these references disclose a salt possessing a polyvalent ion with a self-dispersing pigment and therefore concludes that the combination of a polyvalent salt with a self-dispersing pigment is successfully utilized in inks.

d) In response to Applicant's argument that there is no guidance in WO 96/18695 or Zhu to produce an ink comprising a modified pigment, a polyvalent salt, and a polymer as presently claimed, except through picking and choosing, the Examiner states that Zhu requires the use of both a binder, which is a polymer possessing an anionic functional group, and a conductivity agent, which includes an alkaline earth metal salt that possesses a polyvalent cation. The Examiner concludes that, given that three of the four polymers disclosed by Zhu possess anionic functional groups and three salts contain polyvalent ions, these are not large groups from which to choose the presently claimed salt. The Examiner also states that, while there is no disclosure in Zhu of modified pigments as presently claimed, this is hwy Zhu is used in combination with WO 96/18695, which teaches the use of pigments identical to those presently claimed.

In view of a)-d) above, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to use the modified pigment of WO 96/18695 in the ink of Zhu, thereby arriving at the claimed invention.

Applicant respectfully disagrees. Regarding claims 1-2, 4-9, 11-17, and 22-25, claim 1, as amended, recites an ink composition comprising a) a liquid vehicle, b) at least one modified pigment comprising a pigment having attached at least one functional group, c) at least one salt having a polyvalent ion, and d) at least one polymer comprising at least one functional group. The functional group of the modified pigment and of the polymer are

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 17

capable of coordinating with said polyvalent ion and are anionic. The salt comprises a polyvalent metal cation, and the ink composition is an inkjet ink composition.

In comparison, Zhu discloses an aqueous jet ink composition comprising water, a colorant, a binder resin, and a wax, as well as a process for preparing and printing this ink. An example of the colorant is carbon black, and an example of a binder resin is a styrene-acrylic copolymer. Zhu further teaches that the jet ink compositions may also comprise a conductivity agent. Various salts for this purpose are disclosed, including calcium chloride. However, there is no teaching in Zhu of an ink composition comprising a modified pigment having attached at least one organic group. Only conventional pigments are disclosed.

To cure this deficiency, the Examiner relies on WO 96/18695, which discloses an aqueous ink jet ink comprising an aqueous vehicle and a modified carbon product comprising carbon having attached at least one organic group. The organic group comprises at least one ionic or ionizable group. A variety of additives, including polymers having functional groups, may be added (see page 8, line 13 to page 9, line 27). However, there is no teaching or suggestion of the use of a salt having a polyvalent ion in combination with a polymer and a modified carbon product.

The Examiner has therefore concluded that, since Zhu states that "any" pigment may be used in the disclosed inkjet ink, and since WO 96/18695 discloses modified pigments that can be used in an inkjet ink, it would have been obvious to replace the conventional pigments used in the inkjet ink of Zhu with the modified pigments of WO 96/18695, even if that ink comprises salts, such as calcium chloride.

However, even though both Zhu and WO 96/18695 relate to the same field of endeavor, Applicant believes that these references would not be combined by one skilled in the art, thereby arriving at the present invention. Specifically, Applicant believes that one would not replace the conventional pigments described in Zhu with the modified pigments disclosed in WO 96/18695 having attached anionic functional groups if the aqueous jet ink of Zhu contains a polyvalent cationic salt conductivity agent such as calcium chloride.

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 18

While Zhu states that "any" pigment that can be dispersed in the ink can be used (see column 3, lines 26-28), there is no teaching or suggestion that any of the potential pigments can or should have attached functional groups, particularly attached anionic functional groups. None of the pigments shown in Zhu have attached functional groups. Only conventional pigments are shown. Therefore, use of a salt such as calcium chloride would not be expected to negatively effect the stability of these types of pigments.

By comparison, it is well known in the art that salts, particularly salts comprising polyvalent ions, destabilize ionically stabilized dispersions, especially dispersions of pigments.

This is particularly true when a polyvalent ion is used that has a charge opposite to that of the ionically stabilized pigment. This is taught by WO 96/18695, which states that "the water dispersibility of the modified carbon products depends to some extent on charge stabilization".

For this reason, the ionic strength of the aqueous medium needs to be considered (see page 7, lines 31-34). This is further supported by observations included in the present application and, in particular, paragraph [0046], which states that "addition of the salt may result in flocculation of the pigment". Furthermore, both Lin and Suzuki et al., previously referenced by the Examiner, each describe that the presence of polyvalent salts effects the stability of an ink containing a pigment comprising attached functional groups.

Therefore, one skilled in the art would not simply replace a conventional pigment in an ink comprising a polyvalent metal cation, such as calcium chloride, with a modified pigment having an attached anionic group and have a reasonable expectation of success. In fact, destabilization of the pigment dispersion would have been expected and, for this reason, the combination of modified pigment having an anionic functional group and a polyvalent metal cationic salt would have been avoided. Without a reasonable expectation of success, found in the prior art and not in Applicant's disclosure, a *prima facie* case of obviousness cannot be established (see MPEP 706.02(j))

While the Examiner has cited two references that seem to contradict the teachings of the references noted above, Applicant believes each has been misinterpreted. For example, while JP 2001-081378 teaches the use of various salts and self-dispersed pigments together,

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 19

none of these salts comprise a polyvalent metal cation. Also, Betto et al., as discussed in more detail above, does not relate to inkjet inks, and, in fact, teaches away from inkjettable inks since the presence of salt is clearly taught to cause gellation of the ink. Thus, Betto et al. essentially confirms the statement that polyvalent metal salts destabilize dispersions.

Therefore, Applicant believes that one skilled in the art would not be motivated to use a modified pigment having an attached anionic functional group in an ink composition having a polyvalent metal cation since it would be expected that destabilization of the ink would occur. In considering the teaching of Zhu and the teaching of WO 96/18695, as well as the other references noted above, one skilled in the art would not have any reasonable expectation of success. Furthermore, even if one skilled in the art were to combine these references, Applicant believes, in order to avoid flocculation, one skilled in the art would only combine a modified pigment having an attached anionic functional group with a salt having a polyvalent anion or a non-polyvalent cation, and would therefore not use the calcium chloride conductivity agent disclosed in Zhu. This is clearly not the ink jet ink of the present claims.

Applicant therefore believes that claim 1 is patentable over Zhu in view of WO 96/18695. Claims 2, 5-9, 11-13, 15-17, and 22-25, which depend either directly or indirectly from claim 1, recite further embodiments of the present invention and, for at least the reasons discussed above, are also patentable over these references. Claims 4 and 14 have been cancelled by this amendment, making the rejection of these claims moot.

Regarding claims 27, 28, and 30, claim 27, as amended, recites a method of generating an image comprising incorporating into a printing apparatus an ink composition of the present invention and generating an image on a substrate. The method is an inkjet ink printing method. Since, as discussed above, Applicant believes the ink composition of the present invention is patentable over Zhu in view of WO 96/18695, Applicant further believes that an inkjet printing method using this inkjet ink is also patentable over this combination of references.

Applicant therefore believes that claim 27 is patentable over Zhu in view of WO 96/18695. Claim 28, which depends directly from claim 27, recites further embodiments of

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 20

the present invention and, for at least the reasons discussed above, is also patentable over these references. Claim 30 has been cancelled by this amendment, making the rejection of this claim moot.

Therefore, Applicant believes that claim 1-2, 4-9, 11-17, 22-25, 27-28, and 30 are patentable over Zhu in view of WO 96/18695 and respectfully requests that this rejection be withdrawn.

Zhu in view of WO 96/18695 and further in view of Tsang et al.

The Examiner has rejected claims 10 and 26 as being unpatentable over Zhu (U.S. Patent No. 5,889,083) in view of WO 96/18695, as applied to claims 1-2, 4-9, 11-17, 22-25, 27-28, and 30 above, and further in view of Tsang et al. (U.S. Patent No. 6,150,433).

In paragraph 9 of the Office Action, the Examiner states that the difference between Zhu in view of WO 96/18695 and the presently claimed invention is the requirement in the claims of a pigment having an attached polymer. The Examiner further states that Tsang et al. discloses the use of a pigment having an attached polymer wherein the polymer includes anionic polymers obtained from (meth)acrylic acid in order to produce an ink with reduced smear and increased water fastness, bleed control, and print quality. The Examiner therefore concludes that, in light of the motivation for using a pigment with an attached polymer disclosed by Tsang et al., it would have been obvious to one of ordinary skill in the art to use such a pigment in the ink of Zhu in order to produce an ink with reduced smear and increased water fastness, bleed control, and print quality, thereby arriving at the claimed invention.

While Applicant disagrees with this rejection and the conclusions reached by the Examiner, in order to advance prosecution of this application, claims 10 and 26 have been cancelled without prejudice to filing these claims in one or more continuation applications. Therefore, the rejection of these claims is moot.

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 21

Zhu in view of WO 96/18695 and further in view of Lin

The Examiner has rejected claims 18-19 as being unpatentable over Zhu (U.S. Patent No. 5,889,083) in view of WO 96/18695, as applied to claims 1-2, 4-9, 11-17, 22-25, 27-28, and 30 above, and further in view of Lin (U.S. Patent No. 5,997,623).

In paragraph 10 of the Office Action, the Examiner states that the difference between Zhu in view of WO 96/18695 and the presently claimed invention is the requirement in the claims of a specific type of salt. The Examiner further states that Lin discloses the use of a salt comprising a polyvalent metal cation such as zinc and polyvalent metal anion such as sulfate in order to produce an ink with conductivity suitable for ink jet printing. The Examiner also states that Lin discloses the equivalence and interchangeability of such a salt with calcium chloride as disclosed by Lin. The Examiner therefore concludes that, in light of the motivation for using a salt disclosed by Lin, it would have been obvious to one of ordinary skill in the art to use such a salt in the ink of Zhu, thereby arriving at the claimed invention.

Applicant respectfully disagrees. Claims 18 and 19 depend directly from claim 1, and, as discussed in more detail above, Applicant believes claim 1 is patentable over Zhu in view of WO 96/18695. Applicant believes that one skilled in the art would not be motivated to use a modified pigment having an attached anionic functional group in an ink composition having a polyvalent metal cation, such as calcium chloride, since it would be expected that destabilization of the ink would occur. In considering the teaching of Zhu and the teaching of WO 96/18695, as well as the other references noted above, one skilled in the art would not have any reasonable expectation of success. Furthermore, even if one skilled in the art were to combine these references, Applicant believes, in order to avoid flocculation, one skilled in the art would only combine a modified pigment having an attached anionic functional group with a salt having a polyvalent anion or a non-polyvalent cation, and would therefore not use the calcium chloride conductivity agent disclosed in Zhu. This is clearly not the ink jet ink of the present claims.

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

Page 22

Lin does not cure this deficiency of Zhu in view of WO 96/18695. There is no teaching or suggestion in Lin that would motivate one skilled in the art to combine the salt comprising zinc of Lin with a pigment having an attached anionic group, with any reasonable expectation of success. As discussed above, such a combination would go against the teaching of the art. Therefore, whether Lin discloses the equivalence and interchangeability of this zinc salt and calcium chloride or not, this reference cannot cure the deficiency of Zhu in view of WO 96/18695.

Therefore, Applicant believes that claims 18-19 are patentable over Zhu in view of WO 96/18695 and further in view of Lin and respectfully request that this rejection be withdrawn.

#### Allowable Subject Matter

In paragraph 12 of the Office Action, the Examiner has objected to claims 3, 29, 33, and 49 as being dependent upon a rejected base claim but further states that these would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant is grateful for the allowable subject matter of claims 3, 29, 33, and 49. In response, Applicant has rewritten claims 33 and 49 in independent form, including the features of the respective base claim and any intervening claims. Therefore, Applicant believes that claims 33 and 49 are in condition for allowance.

However, in view of the comments provided herein, claims 3 and 29, which depend directly from claims 1 and 27 respectively, have not been rewritten in independent form since Applicant believes these claims are patentable over the references cited by the Examiner. Applicant also believes that remaining pending claims 1-2, 5-9, 11-13, 15-19, 22-25, and 27-28 should also be found allowable.

U.S. Patent Application No.: 10/062,112

Art Unit: 1714

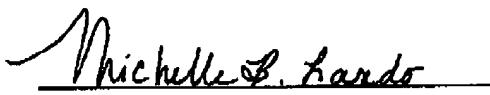
Page 23

Conclusion

In view of the foregoing remarks, Applicants believe that this application is considered to be in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would further expedite the prosecution of the subject application, the Examiner is invited to call the undersigned.

Respectfully submitted,

By:



Robert M. Amici  
Reg. No. 52,554  
Michelle B. Lando  
Reg. No. 33,941  
Cabot Corporation  
Law Department  
157 Concord Road  
Billerica, MA 01821-7001

Date: September 28, 2005  
Attorney Docket No.: 00069CON